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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/868,051	06/13/2001	Kustaa Nyholm	783.1005	5516

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EXAMINER

DANIELS, ANTHONY J

ART UNIT PAPER NUMBER

2615

DATE MAILED: 05/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/868,051

Applicant(s)

NYHOLM, KUSTAA

Examiner

Anthony J. Daniels

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/13/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The references cited in the Search Report PCT have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO/SB/08A and 08B form, must be filed within the set period for reply to this Office action.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed (37 CFR 1.438).
4. Claim 14 is objected to because of the following informalities: On line 1, "...in any of the claims 1..." should be changed to ...as claimed in claim 1... Appropriate correction is required (37 CFR 1.435).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-12,14-27,29 rejected under 35 U.S.C. 102(b) as being anticipated by Parker (US # 5,461,653).

Claims 16-27,29 will be discussed first.

As to claim 16, Parker teaches an apparatus for digital imaging (Figure 2), in which imaging a radiation source is used for irradiating (Figure 2, X-ray source “2”) an object to be imaged (Figure 2, breast “10”) and semiconductor sensors (Figure 2, detectors “46”; Figure 5, pixels “47”; *{The pixels are the sensors.}*) are used for detecting the radiation (Col. 5, Lines 44,45), said apparatus comprising: semiconductor sensors (1) (Figure 2, detectors “46”; Figure 5, pixels “47”) having an active area (A) (Figure 5, MOS transistor “114” and pixel “47” is the active area), and in their three-dimensional structure (Figure 5), an area or areas for control couplings (K) (Figure 5, CMOS readout region “104”; *{On p. 9, Lines 18,19, examiner finds the definition of control couplings.}*), the area covered by the said semiconductor sensors (1) being substantially smaller than the image-forming surface (Figure 2; *{It can be seen in Figure 2 that the breast being imaged is smaller than the sensors, and although the drawings are not to scale nor does Parker state is specifically, the image forming surface of the breast, which will be explained, is inherently larger than one detector.}*), and means for moving the semiconductor sensors (1) (Figure 2, moving mechanisms “52”) to a new position between two irradiations (Col. 3, Lines 23-34), in which apparatus the semiconductor sensors (1) and the means for

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moving the semiconductor sensors are arranged so that the area covered by the semiconductor sensors (1) in their initial position prior to the move, combined with the area covered by the semiconductor sensors (1) in their position after the move, cover the entire image-forming surface (*Examiner interprets the image-forming surface to be the combined image captured before and after the upper and lower collimators, and the sensors have moved from a first position to a second position, two irradiations for both positions from the X-ray source. The image-forming surface, as the examiner interprets, may not be the entire breast.*).

As to claim 17, Parker teaches an apparatus as claimed in claim 16, the area for control couplings (11) of the semiconductor sensor (1) are arranged on one side of the semiconductor sensor (1) (Figure 5, CMOS readout region “104” on the right side of the pixels).

As to claim 18, Parker teaches an apparatus as claimed in claim 16 wherein several semiconductor sensors (1n) are arranged to form rectangular bars (2) (Figure 5; *{Starting from the right-most pixel (pixel to the left of electronics “114”) and moving left, the pixels form a rectangular bar.}*).

As to claim 19, Parker teaches an apparatus as claimed in claim 18, wherein the bars (2) comprise one column (1 x N) of semiconductor sensors (1n) (Figure 5; *{From the explanation of claim 18, it is readily apparent how the “bars” form one column of (1 x N) pixels.}*).

As to claim 20, Parker teaches an apparatus as claimed in claim 19, wherein the semiconductor sensors (1n) are arranged in the bars (2) (Figure 5; *{As can be seen, the bars of pixels repeat downward on the detector “46”.}*) so that the area of control coupling (K) is located on one side of each bar (2) (Figure 5, CMOS readout region “104” surrounds each bar; therefore, being located on one side of each bar).

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As to claim 21, Parker teaches an apparatus as claimed in claim 18, wherein the bars (2) form a sensor matrix (3) (Figure 5) in which the bars (2) are arranged at a distance (A#) from one another (Figure 5), in such a way that the distance (A#) is at most equal to the width of an active area (A) formed by the semiconductor sensors (1n) in the bars (2) (Figure 5; *{From Figure 5, it can be seen that the area between each combined transistor "112" and pixel "47"; heading downward on the detector is smaller than the combined area of the transistor "112" and pixel "47".}*).

As to claim 22, Parker teaches an apparatus as claimed in claim 21, wherein the active area (A) of the outermost bars (2) of the sensor matrix (3) comprise the outer edges of the image-forming surface (*It is inherent in CMOS arrays that the outermost pixel "47" (top left of detector "46") would cover the outer edges of the image-forming surface of the breast.*}).

As to claim 23, Parker teaches an apparatus as claimed in claim 18, wherein the bars (2) comprise two columns (2 x N) of semiconductor sensors (1n) (Figure 5; *{The combined bars of Figure 5 shows a (2 x N) array of pixels "47"}*).

As to claim 24, Parker teaches an apparatus as claimed in claim 23, wherein the semiconductor sensors (1n) are arranged in each bar (2) in such a way that the area for control coupling (K) for each semiconductor sensor (1n) is located on two sides of each bar (2) (Figure 5; *{The two columns of pixels, shown in Figure 5, have a readout region "104" above them and to the left of them.}*).

As to claim 25, Parker teaches an apparatus as claimed in claim 23 wherein the bars (2) form a sensor matrix (3) in which the bars (2) are arranged at a distance (A#) from one another, in such a way that the distance (A#) is at most equal to the width of an active area (A) formed by

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the semiconductor sensors (1n) in the bars (2) (Figure 5; *{If the distance between two columns of $(1 \times N)$ pixels and transistors, is smaller than the active area, than it is inherent that the distance between two columns of $(2 \times N)$ pixels and transistors is smaller than an active area of the pixels which in this case is a column of $(2 \times N)$ pixels and transistors.}*).

As to claim 26, Parker teaches an apparatus as claimed in claim 16, further comprising: means for limiting radiation to an area covered by the semiconductor sensors (1), the means for limiting radiation comprising a suitable collimator construction (4, 5) (Figure 2, upper and lower collimators “38” and “44”).

As to claim 27, Parker teaches an apparatus as claimed in claim 26, further comprising: means for moving the collimator construction (4, 5), and means for moving the semiconductor sensors (1) (Figure 5, moving mechanisms “52”; (Col. 6, Lines 25-35).

As to claim 29, Parker teaches an apparatus as claimed in claim 16, wherein the semiconductor sensors (1) are CMOS sensors (Figure 5; Col. 8, Lines 8-28).

As to claims 1-11,14, claims 1-11,14 are method claims corresponding to the apparatus claims 16-26,29, respectively. Therefore, claims 1-11,14 are analyzed and rejected as previously discussed with respect to claims 16-26,29, respectively.

As to claim 12, Parker teaches an imaging method as claimed in claim 11, further comprising the step of: separately moving the collimator construction and the sensors (Figure 2; *{The collimators and sensor array are moved by separate moving mechanisms “52”.}*).

As to claim 15, Parker teaches an imaging method as claimed in claim 1, wherein the method is used in the context of mammographic imaging (Figure 2, object “10” is a breast).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 13,28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (US # 5,461,653) in view of Milch (US # 4,638,371).

As to claim 13, Parker teaches an imaging method as claimed in claim 11. The claim differs from Parker in that it further requires that the movement of at least one of the collimator construction and the sensors is carried out by means of solenoids.

In the same field of endeavor, Milch teaches a digital imaging system wherein stepper motors (which use solenoids for performance) are used to rotate a reflector plate (Figure 2; Col. 4, Lines 32-49). In light of the teaching of Milch, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a stepper motor as the moving mechanisms of Parker, because an artisan of ordinary skill in the art would recognize that stepper motors are easily adaptable to digital control applications.

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As to claim **28**, Parker teaches an apparatus as claimed in claim 27. The claim differs from Parker in that it further requires that said means for moving at least one of the collimators (4, 5) and the sensors (1) comprise a solenoid.

In the same field of endeavor, Milch teaches a digital imaging system wherein stepper motors (which use solenoids for performance) are used to rotate a reflector plate (Figure 2; Col. 4, Lines 32-49). In light of the teaching of Milch, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a stepper motor as the moving mechanisms of Parker, because an artisan of ordinary skill in the art would recognize that stepper motors are easily adaptable to digital control applications.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony J. Daniels whose telephone number is (571) 272-7362. The examiner can normally be reached on 8:00 A.M. - 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jim Groody can be reached on (571) 272-7950. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD
5/12/2005

A handwritten signature in black ink, appearing to read 'Ngoc-Yen VU', with a long horizontal flourish extending to the right.

NGOC-YEN VU
PRIMARY EXAMINER